Meade® ETX® Astro Telescopes

Let Meade high-resolution optics and revolutionary Autostar™ capability take you on an automated guided tour of the Solar System, the Galaxy, and beyond.

Now even the most novice amateur astronomer can locate and explore the planets, galaxies, and nebulae, as well as star clusters, asteroids, and comets, all at the push of a button. Because, *"more than any other telescope, the Meade ETX has revolutionized amateur astronomy. Since it was introduced in 1996 it has become the standard by which others are judged, combining low price with optical excellence, a solid mounting, and...computerized 'GO TO' facilities."** Meade ETX Astro Telescopes, in four apertures, bring the full range of celestial images to your eye with astonishing levels of clarity, resolution, and definition.

ETX-70AT Astro Telescope

All of the major planets except Pluto are easily observable through the ETX-70AT. Study Saturn and its ring system; the primary cloud belts of Jupiter as well as its four major satellites; the Moonlike phases of Mercury and Venus; prominent features on Mars; the starlike images of the distant planets Uranus and Neptune. The Moon stands out in stark, almost three-dimensional detail — craters, mountain ranges, and fault lines. In our galaxy the telescope displays hundreds of nebulae, star clusters, double and multiple stars, and variable stars — plus dozens of external galaxies in all their variations of form and structure. See the Autostar listing on the facing page for a complete compilation of database objects.

"In decades past, the astronomy world has bemoaned the lack of an effective, affordable beginner's telescope…the Meade ETX-70AT refractor is perhaps the first innovative beginner's telescope for the present generation. And Meade surmounted significant challenges to produce them: Rather than churning out merely a good set of optics, [the ETX-70AT] provides a user-friendly mini-observatory for the computer age…After using the telescope for a few hours, the sea change in how technology will affect beginning observers struck me hard…the potential of the computerized generation is startling. With the ETX-70AT, in a matter of minutes, I could see two or three dozen objects in rapid succession, finding them effortlessly and comparing their appearances much more effectively because they were so easy to locate." — **from the review in *Astronomy*, February, 2001.**

Terrestrial Observing: The Meade ETX-70AT also makes an excellent land-view instrument for the birdwatcher, the naturalist, or for the home with a view. Image quality and resolution typically far exceed levels normally expected of terrestrial telescopes. Terrestrial observers quickly appreciate the advantages afforded by the Autostar hand controller *(see below)*. Using Autostar, many land objects can be readily followed, or tracked, from a distance, using one of nine selectable speeds.

* Quoted from *Using the Meade ETX* by Mike Weasner, Springer-Verlag, 2002.

Fork Mount with Dual-Axis Drive System: In conjunction with the telescope's Autostar hand controller, precision worm gear systems on each axis permit smooth pushbutton motions of the telescope. Integrated to one of the fork arms, the telescope's control panel serves as a central connection point for the hand controller (the *HBX* port), as well as for the RS-232 serial interface adapter (the *AUX* port), an adapter included with the optional #506 AstroFinder Software and Cable Connector Kit *(see Optional Accessories, p. 15).* Using the RS-232 interface, new or revised software may be downloaded through your PC to the telescope; the positions of Earth satellites may be updated for their observation through the telescope; and the positions of newly-discovered objects, such as comets, may be accessed by Autostar.

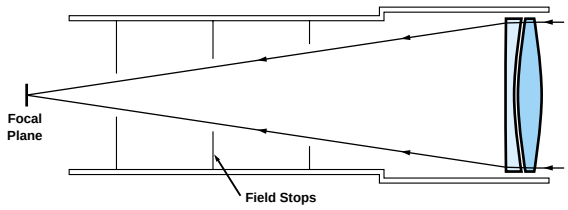
The Meade ETX-70AT is provided as standard equipment with all equipment shown, including the full-length #882 Field Tripod.

Optical System: The ETX-70AT includes a multi-coated, achromatic objective lens of exclusive Meade design and manufactured of Grade-A crown and flint optical glass components. The lens yields razor-sharp images of astronomical and terrestrial subjects.

Flip-Mirror System: For observing in the standard 90° position, flip the internal, optical flat mirror "up." For terrestrial observing with the optional #933 45° Erecting Prism *(see p. 15)* or for photography with the optional #64ST T-Adapter, flip the mirror "down."

Ultraportable and Simple to Use: Easy to carry to any observing location, whether a distant mountaintop or your own back yard, the Meade ETX-70AT telescope brings the excitement of astronomy to users of any age. Just place

The Meade ETX-70AT Optical System



In the optical design of ETX-70AT, light enters from the right through a 2-element objective lens and travels to a focus at the focal plane. Field stops internal to the optical tube prevent off-axis light from reaching the focal plane, thereby enhancing image contrast.

the telescope on any flat surface (or use the standard-equipment field tripod), do a quick, easy alignment of the telescope's computer to the sky, and start observing. Six internal (user-supplied) AA-batteries power the ETX-70AT for about 20 hours.

Autostar Hand Controller — *"the greatest happening in amateur astronomy yet."* For all of their advanced imaging capabilities, portability, ease of use, and contemporary cosmetic design, Meade ETX telescopes are above all uniquely defined by the revolutionary Autostar hand controller.

Included as *standard equipment* with the ETX-70AT, the #494 Autostar controller permits the automatic location of over 1400 celestial objects, including all of the following objects located in the telescope's onboard database:

Solar System	
Planets	8
Moon	1
Asteroids	26
Comets	15
Constellations	88
Deep-Sky	
Named Objects	66
Galaxies	74
Diffuse Nebulae	31
Planetary Nebulae	19
Quasars	11
Caldwell Objects	109
Messier Objects	110
Stars	
Named Stars	79
Double Stars	395
Variable Stars	189
SAO Stars	200
Earth Satellites	50
Total Objects	1471

The Meade ETX-70AT Astro Telescope, shown with standard-equipment #494 Autostar Computer Controller and set up for tabletop astronomy.

Just enter the object you wish to observe on to the Autostar display, press GO TO, and watch as the telescope moves rapidly in seconds to place the object in the telescope's field of view. One observing session validates the prediction made by *Sky & Telescope* that *"The ETX/Autostar concept will go down as the greatest happening in amateur astronomy yet."*

Objects stored in the #494 Autostar's database include the entire range of celestial phenomena and are designed to keep the active observer busy for many a starlit evening.

The above database listing has been specifically chosen as suitable for observing with the ETX-70AT and provides an excellent introduction to the diversity of astronomical objects visible through the telescope.

In addition to its object-locating capabilities Autostar permits pushbutton centering of objects within the telescopic field at any of nine selectable speeds. Once Autostar locates an object, it directs the telescope automatically to track the object across the sky, compensating fully and precisely for the effects of the Earth's axial rotation.

Specifications: ETX-70AT Astro Telescope — Includes achromatic refractor optical tube assembly (D = 70mm, F = 350mm, f/5) with multi-layer optical coatings; internal flip-mirror system for either straight-through or 90° observing position; steel-reinforced ABS fork mount with electric slow-motion controls, setting circles, and locks on both axes; electronic control panel; 9-speed (2x sidereal through 4.5°/sec.) dual-axis motor drive system with #494 Autostar computer controller; sidereal-rate tracking; internal battery compartment accepting six (user-supplied) AA-size batteries; MA9mm (39X) and MA25mm (14X) multi-coated eyepieces; #882 Field Tripod; operating instructions.

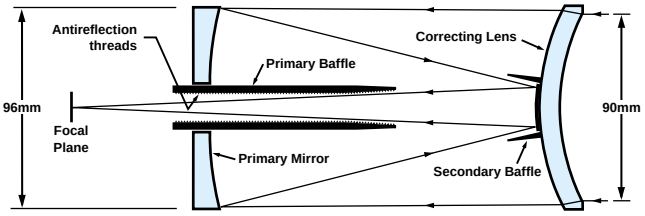
ETX-90AT, ETX-105AT, and ETX-125AT Astro Telescopes

When the original ETX® telescope was introduced in 1996, it quickly created a revolution in amateur astronomy. Here for the first time was a stunningly beautiful, ultraportable, and highly versatile telescope system of unprecedented optical resolution and performance. Within one year of its introduction the ETX became the largest-selling modern telescope in the world.

Meade ETX-90AT, ETX-105AT, and ETX-125AT models build on the original ETX concept to create the most advanced electronically-controlled telescopes — including automatic GO TO object-location with the Autostar™ Computer Controller *(p. 9)* — ever produced in their price range. And yet without sacrificing any of the user-friendly features that started the ETX revolution.

Optical Systems: Manufactured at the Meade Irvine, California, facility, ETX Maksutov-Cassegrain telescopes produce superlative, diffraction-limited optical performance and resolution. Optics so high in contrast, image brightness, and resolution that ETX-90AT, ETX-105AT, and ETX-125AT models often outperform many telescopes of larger apertures.

The Meade ETX-90AT Maksutov-Cassegrain Optical System



In the optical design of the ETX-90AT, light enters from the right through a multi-coated meniscus lens, proceeds to an f/2.2 primary mirror, and then to a convex secondary mirror that multiplies effective focal length by a factor of 6.3. The secondary mirror light baffle, in combination with the antireflection threads inside the primary mirror baffle, produces extremely high contrast astronomical images at the focal plane. The oversize 96mm-diameter primary mirror results in a fully-illuminated (unvignetted) field of view significantly wider than can be obtained with Maksutov optics incorporating primary mirrors of the same apertures as their correcting lenses.

(left to right) **Meade ETX-90AT, ETX-105AT, and ETX-125AT Astro Telescopes,** ready for tabletop observing. For use in standing or seated positions the #884 Deluxe Field Tripod is included as standard equipment.

Fork Mounts with Standard-Equipment Dual-Axis Drive System and #497 Autostar Controller: The rigid fork mountings of ETX Maksutov-Cassegrain models include high-torque DC motors on both telescope axes, permitting electronic operation from the standard-equipment Autostar controller. With the telescope placed in the altazimuth mode on a table, astronomical object-tracking may be accomplished automatically, after a quick and easy 2-minute alignment of Autostar to the sky. Alternately, the telescope may be mounted in either the altazimuth or equatorial modes on the standard-equipment #884 Deluxe Field Tripod.

Cordless Field Operation: The drive base of each telescope accepts eight (user-supplied) AA-batteries that power the telescope for about 20 hours of normal usage, negating any requirement for an external power source in the field. Alternately, the telescope may be powered from an automobile cigarette lighter plug, using the optional #607 Power Cord *(p. 15)*.

Flip-Mirror System: Flip the internal, optical-flat mirror "up" for observing in the standard 90° position; flip the mirror

"down" for terrestrial observing with the optional #932 45° Erecting Prism or for photography with the optional #64 T-Adapter *(p. 15)*.

Materials and Coatings: ETX optical systems *(p. 6)* include a Maksutov meniscus corrector lens of Grade-A BK7 optical glass. This lens is individually hand-figured by a Meade master optician to achieve an optical null in combination with the Pyrex® primary mirror. High transmission magnesium fluoride (MgF_2) coatings on both sides of the correcting lens, as well as aluminum/silicon monoxide coatings on the primary and secondary mirrors, are provided as standard equipment. Optional coatings, described below, increase light transmission and reflectance still further.

Ultra-High Transmission Coatings (UHTC): Available optionally with the ETX-90AT, ETX-105AT, or ETX-125AT, the Meade UHTC group permits the highest levels of light transmission (about a 20% increase in total telescope light transmission compared to the standard coatings) ever offered on amateur telescopes. The UHTC group, if desired, must be specified at the time of telescope order. See pp. 26 -27 for full details on this important advance in optical coatings.

"Our [ETX-105] sample, purchased from stock at a local telescope dealer, was in perfect collimation...the version–22Et Autostar we tested behaves like mature technology...we sent the scope to a series of targets spread across the sky. It found each one with 100 percent success...Indeed, 90 percent of the targets were positioned within the center half of the field of view...Views of the Moon and planets were all satisfyingly crisp. The rings of Saturn, including the Cassini Division, were sharply rendered, and Jupiter's faded Red Spot was easy to see as it crossed the planet's central meridian...One of my most enjoyable moments with this Mak came while I was viewing Castor on a foggy evening that offered very good seeing. The scope split this unequal double star very cleanly and displayed the sort of Airy disks and diffraction rings that one sees in optical textbooks but seldom in real life."

— from the review in *Sky & Telescope,* March, 2002.

Standard Equipment: Meade ETX Astro Telescopes are supplied as complete instruments. Standard equipment includes a premium-grade Meade Series 4000 Super Plössl 26mm eyepiece for 48X with the ETX-90AT, 57X with the ETX-105AT, or 73X with the ETX-125AT. The 8 x 21mm viewfinder of the ETX-90AT incorporates an internal roof prism that results in an erect-image orientation, facilitating

The fully adjustable #884 Deluxe Field Tripod, included as standard equipment with ETX-90AT, ETX-105AT, and ETX-125AT models, permits seated or standing observations in either the altazimuth or equatorial modes. The tripod has an elevation range of 20° to 90°.

Specifications and Features: ETX-70AT, ETX-90AT, ETX-105AT, and ETX-125AT Astro Telescopes

TELESCOPE:	ETX-70AT	ETX-90AT	ETX-105AT	ETX-125AT
Optical Design	Achromatic refractor	Maksutov-Cassegrain	Maksutov-Cassegrain	Maksutov-Cassegrain
Primary Mirror Diameter	—	96mm (3.78")	116mm (4.56")	138mm (5.43")
Clear Aperture	70mm (2.8")	90mm (3.5")	105mm (4.13")	127mm (5.0")
Focal Length, Focal Ratio	350mm f/5	1250mm f/13.8	1470mm f/14	1900mm f/15
Near Focus *(approx.)*	17 ft. (5.2m)	11.5 ft. (3.5m)	15 ft. (4.6m)	15 ft. (4.6m)
Resolving Power (arc secs.)	1.6	1.3	1.1	0.9
Optical Coatings	multi-coated objective lens	MgF_2; standard aluminum/SiO	MgF_2; standard aluminum/SiO	MgF_2; standard aluminum/SiO
Ultra-High Transmission Coatings *(p. 26)*	—	optional at time of purchase	optional at time of purchase	optional at time of purchase
Limiting Visual Stellar Magnitude	11.3	11.7	12.1	12.5
Image Scale	4.14°/inch	1.16°/inch	0.99°/inch	0.76°/inch
Maximum Practical Visual Power	240X	325X	420X	500X
Optical Tube Dimensions (dia. x length)	3.6" dia. x 12" (9.3cm x 30.4cm)	4.1" x 11" (10.4cm x 27.9cm)	4.88" x 12.9" (12.4cm x 32.8cm)	5.75" x 14.2" (14.6cm x 36cm)
Eyepiece(s)	MA9mm, MA25mm	Super Plössl 26mm	Super Plössl 26mm	Super Plössl 26mm
Secondary Mirror Obstruction (dia.; %)	—	1.1" (27.9mm); 9.6%	1.32" (33.0mm); 9.4%	1.55" (39.4mm); 9.6%
Telescope Mounting	fork type; double tine	fork type; double tine	fork type; double tine	fork type; double tine
Setting Circle Diameters	Dec.: 3.7"; RA: 7"	Dec.: 3.5"; RA: 7"	Dec.: 3.81"; RA: 7.8"	Dec.: 4.3"; RA: 9"
RA and Dec. Motor Drive Systems	DC servo motors with encoders, both axes; 9-volts DC	DC servo motors with encoders, both axes; 12-volts DC	DC servo motors with encoders, both axes; 12-volts DC	DC servo motors with encoders, both axes; 12-volts DC
Slow-Motion Controls	electric, 9-speed, both axes	electric, 9-speed, both axes	electric, 9-speed, both axes	electric, 9-speed, both axes
Autostar Controller	included (#494)	included (#497)	included (#497)	included (#497)
Hemispheres of Operation	North and South	North and South	North and South	North and South
Batteries *(user-supplied)*	6 x AA	8 x AA	8 x AA	8 x AA
Battery Life *(approx.)*	20 hrs	20 hrs.	20 hrs.	20 hrs.
Bearings	Dec.: Acetal; RA: Nylon	Nylon, both axes	Dec.: ball bearings; RA: radial ball bearing	Dec.: ball bearings; RA: ball bearings
Materials: Tube Body	high-impact ABS	aluminum	aluminum	aluminum
Mounting	reinforced high-impact ABS	steel-reinforced high-impact ABS	internal aluminum structure with high-impact ABS	internal aluminum structure with high-impact ABS
Primary Mirror	—	Pyrex® glass	Pyrex® glass	Pyrex® glass
Correcting Lens	—	BK7 optical glass, Grade-A	BK7 optical glass, Grade-A	BK7 optical glass, Grade-A
Tripod; net weight	#882 Field Tripod; 6 lbs.	#884 Deluxe Field Tripod; 11 lbs.	#884 Deluxe Field Tripod; 11 lbs.	#884 Deluxe Field Tripod; 11 lbs.
Telescope Dimensions	15" x 7.3" x 8.5"	15" x 7.3" x 8.5"	17" x 8" x 10"	19" x 8.9" x 10.8"
Telescope Net Weight, less tripod	6.8 lbs. (3.0 kg)	7.8 lbs (3.5 kg)	13.5 lbs. (6.1 kg)	15.2 lbs. (6.9 kg)
Telescope Shipping Weight, less tripod	11.9 lbs (5.4 kg)	12.4 lbs (5.6 kg)	18.4 lbs (8.3 kg)	25.2 lbs. (11.4 kg)

the quick location and field-centering of both terrestrial and astronomical objects. ETX-105AT and ETX-125AT models are supplied with an 8 x 25mm right-angle viewfinder for comfortable object-sighting with the larger instruments. The #884 Deluxe Field Tripod is included for rigid mounting of the telescope during standing or seated observing in either the altazimuth or equatorial mode. Use the standard-equipment #497 Autostar controller *(see below)* for automatic GO TO object locating.

"I find it impossible to choose adequate words that describe the extraordinary performance of the ETX [90mm]. *My first object was the waxing gibbous Moon. At 50X the image showed incredible contrast and sharpness along the terminator. It begged for higher magnifications. At 190X the lunar image fully maintained its rock-hard focus. Even at 350X, one hundred power per inch of aperture, no breakdown of the image occurred. Now I had to give the ETX the most sensitive test of all, viewing a second magnitude star at this same extreme power. The 350X star image was a textbook classic. Clearly defined, faint, concentric diffraction rings surrounded the small, bright Airy disc. Taking the star both in and out of focus revealed identically sized secondary shadow obstructions. Clearly, I was observing through an optical system that has no detectable wavefront error."* — **Ron Smith, Professor of Astronomy, Santa Rosa Junior College, Santa Rosa, California.**

Optional Accessories: Fifteen optionally available eyepieces *(p. 15)* permit magnification ranges of from 31X to over 300X with the ETX-90AT, from 37X to over 400X

For terrestrial observing with the ETX-90AT, ETX-105AT, and ETX-125AT Astro Telescopes the #932 45° Erecting Prism attaches to the telescope's rear cell and presents correctly-oriented images, viewed at a convenient 45° angle. Also shown in this photo are the Declination lock, focuser knob, and flip-mirror knob.

with the ETX-105AT, or from 48X to over 450X with the ETX-125AT. Meade Super Plössls are excellent eyepieces with any ETX model, or use a Meade Super Wide 13.8mm, 18mm, or 24.5mm ocular for spectacular moderate-power, wide-angle observing. The #126 2x Barlow Lens, a special short-focus Barlow ideally suited to ETX systems, doubles the power of any eyepiece. For terrestrial photography or astrophotography of the Moon and planets, the #64 T-Adapter threads to the telescope's rear cell and, with the appropriate T-mount, accepts any 35mm camera with removable lens.

The #64 T-Adapter converts ETX telescopes into long-focus telephoto lenses for attachment to 35mm camera bodies by means of the appropriate T-Mount. In this way ETX models may be used for terrestrial photography or for astrophotography of the Moon and planets. (With the ETX-70AT telescope use the #64ST T-Adapter.)

#497 Autostar Computer Controller

One of the most important advances in telescope control in the past 25 years, the Meade #497 Autostar Computer Controller turns the ETX-90AT, ETX-105AT, or ETX-125AT into an automatic celestial object locating system. Just plug the Autostar into the telescope's *HBX* port, do a quick *(less than one minute!)* telescope alignment, and you're ready to observe any object in the Autostar's 30,000-object database.

The #497 Autostar Computer Controller is included as standard equipment with ETX-90AT, ETX-105AT, and ETX-125AT Astro Telescopes.

Best of all, the Meade Autostar is *easy* to use. Even the most novice observer will find himself or herself locating dozens of fascinating celestial objects the very first night out — from commonly-observed objects such as the rings of Saturn, the satellites of Jupiter, and the Orion Nebula (M42); to more difficult objects such as the Ring Nebula (M57) in Lyra, the Spiral Galaxy (M33) in Triangulum, and the Sombrero Galaxy (M104) in Virgo; to very obscure objects near the telescope's threshold of visibility such as the diffuse nebula NGC 6559 in Sagittarius, the galactic star cluster NGC 1778 in Auriga, and the spiral galaxy NGC 3310 in Ursa Major.

Any of Autostar's database objects can be called up and entered on the hand controller display in seconds. The observer then simply presses the GO TO pushbutton and

watches as the telescope automatically slews (moves) to the object and places it in the field of view. The effect of Autostar is to bring objects easily within reach which were previously unreachable for all but the most dedicated of amateur astronomers.

Without exaggeration the Meade Autostar Computer Controller opens up a new era in astronomical study for the casual or beginning astronomer, just as Meade LX200 and LX200GPS Schmidt-Cassegrains *(p. 32)* have for the advanced amateur. *Most Autostar users see more celestial objects in one night's viewing than typical first-time telescope owners previously have in a lifetime.*

Object Database: Included within Autostar's database are all of the following astronomical objects — a range of objects certain to keep even the most active amateur astronomer growing in his or her studies of the skies for years:

5,386	objects from the Index Catalog (IC); galaxies, nebulae, and star clusters of all types; the complete Index Catalog
7,840	objects from the New General Catalog (NGC); additional galaxies, nebulae, and star clusters of all types; the complete New General Catalog
109	objects from the Caldwell Catalog of the best objects for small telescopes
110	Messier (M) objects; the complete Messier catalog
16,800	stars from the Smithsonian Astrophysical Observatory (SAO) catalog, including double stars, variable stars, and other stars of special note
50	Earth-orbiting satellites
26	asteroids, including all of the brightest asteroids
15	periodic comets
8	major planets from Mercury to Pluto

Any of the objects in the preceding listing can be located simply by calling up the object from the Autostar database and pressing GO TO. Within seconds Autostar directs the ETX telescope to move automatically to the object and place it within the telescopic field of view with uncanny precision.

Meade ETX-90AT Astro Telescope. Shown packed in optional #774 Hard Carrying Case for easy portability in the field.

"Stellar diffraction patterns were virtually textbook-perfect…the Cassini Division in Saturn's rings popped into view despite the rings' low tilt. [Double-star] *Epsilon Lyrae's component stars were cleanly split…The Moon was outstanding even at 75X per inch of aperture. Daytime terrestrial views were tack-sharp with rich color saturation. I could see every wisp of velvet on the antlers of a deer 50 feet away… the ETX [90mm] was totally free of chromatic aberration, making this an ideal all-purpose telescope for anyone wanting to inspect eagles at 100 yards and stars at 100 light-years."* **— from the review in *Sky & Telescope,* January 1997.**

Call-up of an object from the database is facilitated by Autostar's simple menu options. For example, to enter NGC 6960 on the Autostar display, the observer selects in sequence (and in a few seconds of keystrokes): OBJECT/DEEP SKY/NGC OBJECTS/6960. When GO TO

The ETX-90AT Astro Telescope, mounted in the equatorial mode on the #884 Deluxe Field Tripod. Tripod height is continuously adjustable from 25" to 43". A graduated scale for elevation (latitude) angle permits precise polar alignment of the telescope's fork mount.

is pressed, the telescope moves at 5° per second on both axes, simultaneously, to place NGC 6960, the Veil Nebula in the constellation Cygnus, in the telescope's field of view.

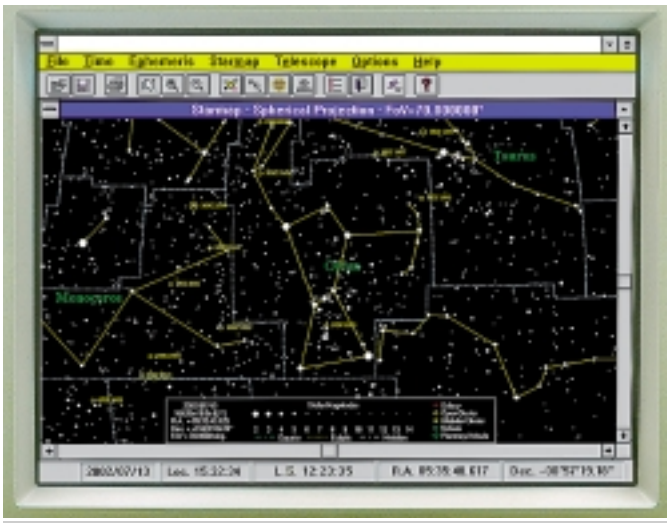
Additional Capabilities: In addition to database object selection and observation, Autostar permits a wide array of fascinating and educational capabilities:

Automatic GO TO capability to any astronomical object of known Right Ascension and Declination, plus *digital readouts* of telescope position, continuously in RA and Dec.

Precise sidereal-rate tracking in either altazimuth or equatorial modes. Once an object is located by Autostar, the telescope automatically tracks it and keeps it centered in the telescope's field of view, fully compensating for the Earth's rotation.

200 User-Defined Objects: The observer can add the locations of up to 200 objects of his/her choosing, store these objects in Autostar's memory, and call them up at any time.

9-Speed Dual-Axis Operation: Use the Autostar pushbuttons to move the telescope on either or both axes, simultaneously, at any of nine drive speeds, from 2x sidereal to 5°/second.



Point-and-click astronomy with Meade AstroFinder software, the #505 Connector Cable Set, and an ETX telescope.

Guided Tours: Allows Autostar to choose the best objects for observing on any given night.

GO TO capability through Autostar's RS-232 serial interface, using Meade AstroFinder™ astronomical software:* Use the optionally-available package of AstroFinder software *(p. 15)* and the #505 Connector Cable Set to form a system consisting of the ETX telescope + Autostar + your PC. Point and click to any celestial object on the PC display and watch as the telescope moves to the object and places it in the field of view.

Plus: over 20 other menu options, including major event menus (*e.g.,* times of Moonrise, Moon phases, etc.); utility functions (*e.g.,* timer, alarm, eyepiece power calculations); and much more.

With Autostar plugged into your ETX-90AT, ETX-105AT, or ETX-125AT, the astronomical universe is in the palm of your hand: never before has such powerful telescope technology been so easy to operate, even by the most casual observer.

*For PC's with USB ports order the Meade **USB to RS-232 Bridge Cable**, which permits connection between the telescope's RS-232 serial interface and the PC's USB port. *(See p. 15.)*

Sky & Telescope reviews the Meade ETX-90AT

Since its introduction in early-1999, the impact of the Meade ETX-90AT Astro Telescope, and its predecessor, the ETX-90EC, has been felt throughout the astronomical community. In its May, 1999, issue *Sky & Telescope* described this impact well in their detailed review.

As a prelude to the review the magazine's Editor-in-Chief, Leif J. Robinson, stated in an editorial entitled *Everyone's Telescope:*

"...A prediction: The ETX/Autostar concept will go down as the greatest happening in amateur astronomy yet. Indeed, I believe it will grow the hobby on a scale heretofore unimagined…In one brilliant stroke Meade's brainy ETX system has erased the learning curve.

...I see a huge societal impact by the ETX/Autostar. Suddenly there is no excuse for anyone with even the slightest interest in astronomy *not* to become a participant. The nighttime sky is now readily accessible to teachers, scout leaders, environmentalists — anyone whose gray cells don't quit at night. If you know where north is (even roughly) and can level the telescope's tube (even roughly), the sky's the limit!

"...A prediction: The ETX/Autostar concept will go down as the greatest happening in amateur astronomy yet. Indeed, I believe it will grow the hobby on a scale heretofore unimagined."

The ETX [-90AT] is small, for sure. But so was David. Autostar is the brain that will defeat the Goliath of mysticism, academe, and technobabble that has made astronomy seem beyond the ken of most ordinary folk. Now anyone can play the backyard-astronomy game cheaply and without fear of frustration. I'll bet thousands of kids this year will see the Ring Nebula, NGC 188, or M78 with the ETX/Autostar. That wouldn't have been possible a year ago because few could have found them.

Meade ETX-90AT Astro Telescope

The ETX/Autostar is not just a new telescope system. It's a revolution! Its impact on amateur astronomy and science education will be unprecedented."

Excerpts from Associate Editor Dennis di Cicco's review, *A "Hot" Telescope Gets Even Hotter:*

"Meade sets a new standard by providing user-friendly capabilities never before available from an inexpensive telescope...When we reviewed Meade's 90-millimeter ETX Maksutov-Cassegrain in the January, 1997, issue, we called it the hottest telescope ever. Well, it just got hotter. A *lot* hotter!

...The optics in our test telescope were excellent and consistent with the scope we reviewed in 1997, which was anonymously purchased. Star images came to a precise focus with a crisp,

round Airy disk surrounded by a bright diffraction ring and several fainter ones. Star images inside and outside of focus were indistinguishable from one another. The optics are fully baffled to suppress flare and scattered light, and multicoatings provide very contrasty views of the Moon and terrestrial scenes.

At 156X the scope easily showed the companion of the brilliant double star Rigel in Orion. Although the 9.5-arcsecond separation

"I believe that one day museumgoers will look at one of these instruments in a glass case and read a placard stating that this telescope changed the way everyone looks at the stars."

of this pair isn't challenging for small apertures, the nearly 7-magnitude difference in brightness between the two stars can overwhelm optics that deliver low-contrast images. At the same magnification the ETX-90[AT] split 4-arcsecond Castor in Gemini with lots of dark sky between the components. What really impressed me, however, was the clean split of Eta Orionis at 250X. With a current separation of 1.7 arcseconds, this pair is within 0.5 arcsecond of the scope's Dawes limit...the sharp images are very satisfying and a frequent reminder of the excellent optical quality.

The Moon was beautiful at any magnification, with black shadows contrasting sharply with illuminated features along the terminator. Venus appeared dazzlingly white with no color fringes except those caused by atmospheric refraction…Saturn was very impressive. As the planet snapped into focus in the supplied 26-mm (48X) eyepiece, I could easily see the rings' Cassini Division and several bands on the ball of the planet. Even at this modest magnification the moons Titan, Rhea, and Dione were clearly visible, and Tethys became evident when the power was increased to 156X.

The control panel of ETX-90AT, ETX-105AT, and ETX-125AT telescopes permits external powering, if desired.

The bottom line is that the ETX-90[AT] showed me everything I could expect from an instrument of its size. The mechanics of the optical tube assembly are also first rate, with barely a hint of lateral image shift as the focus knob is turned back and forth.

…The more time I spent with Autostar, the more I became amazed at what is packed into this relatively small controller.

...I selected the "easy" alignment procedure and followed the instructions that scrolled across the LCD — no need to fumble with the manual in the dark. …Jupiter was obvious in the twilight and also easy to locate within the Autostar's Object menu. I hit the Go To key and the scope began slewing in the right direction…To have it find Jupiter automatically is simply amazing! …Venus was near the horizon, but the ETX-90[AT] effortlessly positioned it within the field of the main eyepiece.

…At the heart of any telescope is optical quality. Several generations of amateur astronomers have elevated the 3.5-inch Questar to icon status because of its fine optics. The three ETXs that I've used have matched the Questars I've tried.

One final thought. Someone with an affinity for collecting should consider buying an ETX-90[AT] and Autostar and pack them safely away. I believe that one day museumgoers will look at one of these instruments in a glass case and read a placard stating that this telescope changed the way everyone looks at the stars."

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ETX-90AT Astro Telescope: For the casual or beginning observer the Meade ETX-90AT may be all the telescope ever required. Or, for the advanced astronomer who already owns a larger instrument, the ETX-90AT is the perfect ultraportable, diffraction-limited field telescope. Observe the continually changing cloud-belt patterns on the surface of the planet Jupiter; shadows cast on to Jupiter as one of its four principal satellites transits the planet's disc; the magnificent ring system and satellites of Saturn as well as dusky markings and the ring-shadow on the surface of

Shown with optional #64 T-Adapter for 35mm photography.

Specifications: ETX-90AT Astro Telescope — Includes Maksutov-Cassegrain optical tube assembly (D = 90mm (3.5"), F = 1250mm, f/13.8) with MgF_2 coatings on the correcting lens and standard aluminum coatings on the primary and secondary mirrors (Ultra-High Transmission Coatings, p. 26, available optionally); internal flip-mirror system for either straight-through or 90° observing position; steel-reinforced ABS fork mount with electric slow-motion controls, setting circles and locks on both axes; electronic control panel; 9-speed (from 2x sidereal to 5°/sec) dual-axis motor drive system with #497 Autostar controller; sidereal-rate tracking in either altazimuth or equatorial mode; internal battery compartment accepting eight (user-supplied) AA-size batteries; 8 x 21mm erect-image viewfinder; Series 4000 Super Plössl 26mm eyepiece (1.25"); #884 Deluxe Field Tripod; operating instructions.

Saturn; Moon craters by the hundred, plus lunar rilles, mountain ranges, and fault lines, all visible in brilliant, high-resolution, high-contrast detail; the variable phases of the planets Mercury and Venus; prominent features on the surface of Mars. In deep-space the motivated observer will find it difficult to exhaust the quantity of visible phenomena: the incandescent filamentary structure of the Orion Nebula; the elliptical luminosity of the Andromeda Galaxy with its brilliant nucleus; the shining orb of the Hercules globular cluster with many of its outermost stars resolvable. These

are only a few of the literally thousands of celestial objects within the view of the Meade ETX-90AT telescope. Star catalogs list innumerable double and multiple star systems, variable stars, open star clusters, globular clusters, diffuse nebulosities, planetary nebulae, and spiral galaxies within the grasp of the instrument. *The standard-equipment #497 Autostar Computer Controller (p. 9) locates all of these objects automatically, in seconds.*

ETX-105AT Astro Telescope: Manufactured with an aluminum fork mount dedicated specifically to its size and aperture, the ETX-105AT Astro Telescope moves effortlessly across the skies on ball bearing axes, in either manual or electronic modes. And, at a relatively modest increase in purchase price, the ETX-105AT yields 36% more light-collecting power than the ETX-90AT. The entire range of celestial objects — the eight major planets, the Moon, galaxies, nebulae, star clusters — as well as terrestrial objects, may be observed with a significant, and immediately apparent, increase in resolution and image brightness. At the same time, the ETX-105AT maintains most of the compactness and ultraportability of the smaller-aperture ETX-90AT. As a compromise between the larger light-gathering capability of the ETX-125AT and the ultraportability of the ETX-90AT, the ETX-105AT is an excellent, and very popular, choice.

Shown with optional #64 T-Adapter for 35mm photography.

Specifications: ETX-105AT Astro Telescope — Includes Maksutov-Cassegrain optical tube assembly (D = 105mm (4.13"), F = 1470mm, f/14) with MgF_2 coatings on the correcting lens and standard aluminum coatings on the primary and secondary mirrors (Ultra-High Transmission Coatings, p. 26, available optionally); internal flip-mirror system for either straight-through or 90° observing position; aluminum fork mount with electric slow-motion controls, setting circles and locks on both axes; electronic control panel; 9-speed (from 2x sidereal to 5°/sec) dual-axis motor drive system with #497 Autostar controller; sidereal-rate tracking in either altazimuth or equatorial mode; internal battery compartment accepting eight (user-supplied) AA-size batteries; 8 x 25mm right-angle viewfinder; Series 4000 Super Plössl 26mm eyepiece (1.25"); #884 Deluxe Field Tripod; operating instructions.

ETX-125AT Astro Telescope: With *twice* the light-collecting area of the ETX-90AT, the ETX-125AT permits a much broader range of astronomical study. Jupiter's cloud belts, for example, are observable at a significantly heightened level of detail, with whirls and festoons and the Great Red Spot readily visible as they transit the planet's disc; the Cassini Division in Saturn's rings is routinely seen, as are additional features of the planet's surface, even under less than perfect seeing conditions; microfine lunar detail beyond the reach of smaller telescopes can be resolved in the ETX-125AT. In deep-space the ETX-125AT's larger aperture enables the observation of galaxies and nebulae in much wider extension and permits the resolution of celestial objects as faint as magnitude 12.5. The entire Messier listing of 110 objects is now not only visible, but, in addition, every object takes on a readily discernible structure. The observer who accepts astronomy as a serious field of interest will find the Meade ETX-125AT a deeply satisfying instrument for a lifetime of high-resolution astronomical study.

Shown with optional #64 T-Adapter for 35mm photography.

Specifications: ETX-125AT Astro Telescope — Includes Maksutov-Cassegrain optical tube assembly (D = 127mm (5.0"), F = 1900mm, f/15) with MgF_2 coatings on the correcting lens and standard aluminum coatings on the primary and secondary mirrors (Ultra-High Transmission Coatings, p. 26, available optionally); internal flip-mirror system for either straight-through or 90° observing position; aluminum fork mount with electric slow-motion controls, setting circles and locks on both axes; electronic control panel; 9-speed (from 2x sidereal to 5°/sec) dual-axis motor drive system with #497 Autostar controller; sidereal-rate tracking in either altazimuth or equatorial mode; internal battery compartment accepting eight (user-supplied) AA-size batteries; 8 x 25mm right-angle viewfinder; Series 4000 Super Plössl 26mm eyepiece (1.25"); #884 Deluxe Field Tripod; operating instructions.

Meade® ETX-90 and ETX-125 Spotting Scopes

For high-resolution imaging of terrestrial subjects, Meade ETX Spotting Scopes are two of the finest instruments ever developed at any price. Explore the subtleties of a bird's feather structure at 50 yards; read license plates more than half a mile in the distance; observe people walking on a street two miles in the distance; or use an ETX Spotting Scope for casual astronomical observations of the Moon, planets, and deep-space. The possibilities are as limitless as your own imagination.

Meade ETX Spotting Scopes include the exact same astronomical-quality, diffraction-limited optical tube assemblies as their respective Astro Telescope versions (p. 6). As a result these systems far outperform other terrestrial telescopes not manufactured to within such precise optical tolerances. ETX Spotting Scopes do not, however, include the Astro Telescopes' fork mountings or internal motor drives, features specifically designed for extensive astronomical applications.

Flip-mirror systems on each unit permit quick adaptation from visual observing at 90°, to fully-image-erect viewing at 45°, to through-the-telescope 35mm photography with the optional #64 T-Adapter. Armed with their extremely long focal lengths (1250mm for the ETX-90, 1900mm for the ETX-125), and yet mounted in relatively short, portable tube assemblies, ETX optics reveal distant photographic detail far beyond the capabilities of standard focal length lenses and without the physical inconvenience of typical long lenses.

ETX-125 *(top)* and ETX-90 Spotting Scopes include the same high-resolution optics as ETX Astro Telescopes. (Tripods not included.)

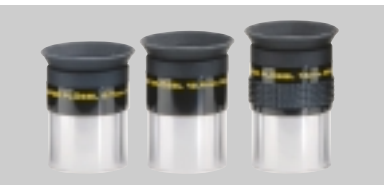
The ETX-90 Spotting Scope is an ideal terrestrial instrument in virtually any observing environment; most first-time users are startled by the level of visible detail and resolution. In situations where the subject is at a greater distance from the observer, or where lighting conditions are less than perfect, the ETX-125, with twice the light-collecting lens area of the ETX-90, provides an excellent alternative. Either spotting scope is intended for a lifetime of ultra-high-resolution imaging.

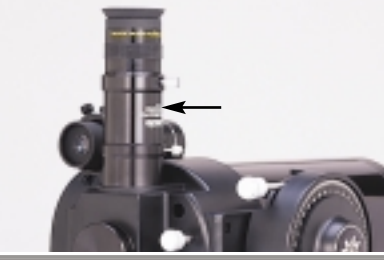
Provided as standard equipment with each spotting scope are the #932 45° Erecting Prism, for fully correctly-oriented terrestrial images; an 8 x 21mm erect-image viewfinder (ETX-90) or 8 x 25mm right-angle viewfinder (ETX-125); and a multi-coated Meade Super Plössl 26mm eyepiece yielding 48X with the ETX-90 and 73X with the ETX-125. Optional eyepieces *(p. 15)* enable the ETX spotting scopes to be used at terrestrial magnifications between 31X and 195X (ETX-90) or between 48X and 297X (ETX-125).

Specifications: ETX-90 and ETX-125 Spotting Scopes — Each includes Maksutov-Cassegrain optical tube assembly (ETX-90: D = 90mm, F = 1250mm, f/13.8; ETX-125: D = 127mm, F = 1900mm, f/15) with MgF_2 coatings on the correcting lens and standard aluminum coatings on the primary and secondary mirrors (Ultra-High Transmission Coatings, p. 26, available optionally); internal flip-mirror system for either straight-through or 90° observing position; 8 x 21mm achromatic erect-image viewfinder (ETX-90) or 8 x 25mm achromatic right-angle viewfinder (ETX-125); Series 4000 Super Plössl 26mm eyepiece for 48X (ETX-90) or 73X (ETX-125); #932 45° Erecting Prism; tripod adapter block for attachment of the spotting scope to any standard (1/4 - 20) photo tripod; operating instructions.

Optional Accessories for ETX Telescopes

See also pp. 94 - 107.





Eyepieces: For higher and lower magnifications with the ETX-90AT, -105AT, and -125AT, Meade Super Plössl and Super Wide Angle Eyepieces *(p. 94)*, as well as the Series 4000 8mm to 24mm Zoom Eyepiece *(p. 96),* yield extremely high-resolution imaging. A useful selection includes the SP9.7mm, SP12.4mm, and SWA18mm; Ultra Wide 4.7mm and 6.7mm eyepieces are well suited for high power observing of the Moon and planets. Meade Plössl 4mm, 5mm, and 6mm eyepieces *(lower photo at left)* permit higher powers with the ETX-70AT; the wide-angle WA18mm eyepiece is ideal for scanning star fields or for terrestrial applications with the ETX-70AT.

#825 and #827 8 x 25mm Right-Angle Viewfinders: Included as standard-equipment on the ETX-105AT and ETX-125AT, the 8 x 25mm Right-Angle Viewfinder permits a comfortable 90° viewing position with 70mm and 90mm ETX models as well. The finder's wide-angle 7.5° actual field facilitates object-location. Precise focusing of the image is accomplished with a helicoid mechanism. **#825:** for ETX-90AT; fits into the same bracket as the 8 x 21mm finder supplied with the telescope. **#827:** for ETX-70AT; includes required mounting bracket.

#126 2x Barlow Lens: An amplifying lens, the multi-coated #126 2x Barlow *(arrow)* doubles the powers of all eyepieces with which it is used. Insert the Barlow into the telescope's eyepiece holder first, followed by an eyepiece. The #126 is intended for astronomical applications. Use with any ETX model.

#64 and #64ST T-Adapters: The basic means of photography through any ETX Astro Telescope or Spotting Scope, the T-Adapter threads to the rear cell of the telescope, followed by a T-mount appropriate to the user's brand of 35mm camera. In this way the camera body is rigidly coupled to the telescope's optical system, which in effect becomes the camera's lens. **#64:** for ETX-90AT, -105AT, -125AT. **#64ST:** for ETX-70AT.

45° Erecting Prisms: All ETX models include an internal flat mirror to reflect light to the telescope's 90° astronomical observing position; in this position the telescope's image is upright, but reversed. For terrestrial observing the 45° Erecting Prism results in a correctly oriented image and a convenient 45° observing angle. **#932:** for ETX-90AT, -105AT, -125AT. **#933:** for ETX-70AT.

Dew Shields: Each dew shield *(arrow)* threads into the front lens cell and effectively inhibits the formation of dew on the lens surface. **#670**: for ETX-70AT; **#673**: for ETX-90AT; **#675**: for ETX-105AT; **#678**: for ETX-125AT.

Electric Focusers: Meade-engineered for smooth, rapid focusing of the image with ETX-90AT, and larger, models, each focuser includes coarse and microfine speeds. The standard-equipment hand controller accepts one (user-supplied) 9-volt battery and focuses the ETX-90 and ETX-125 Spotting Scopes. On the ETX-90AT, -105AT, and -125AT the focuser plugs into, and is powered by, the telescope's control panel, with operation effected through the Autostar handbox. **#1244:** for ETX-90 or -105 models; **#1247:** for ETX-125 models.

AstroFinder Software/Connector Cable Kit: With Meade AstroFinder software loaded into your PC, Autostar-equipped ETX telescopes may be remotely controlled from the PC display. For ETX-70AT order with #506 Connector Cable Set; for all other ETX models order with #505 Connector Cable Set. *See p. 11.*

USB to RS-232 Bridge Cable: The Bridge Cable permits connection of any Meade telescope's RS-232 serial interface to a PC's USB port. The sequence of connection is: telescope/RS-232 port + #505 or #506 Connector Cable *(above)* + USB Bridge Cable + PC. Driver software is included on a CD-ROM; in effect this driver software creates a virtual serial port within the PC. The driver software is compatible with Windows 98, ME, 2000, and XP.

Hard Carry Cases: For secure portability of ETX Astro Telescope models in the field, Meade Hard Carry Cases are fully lined with fitted foam inserts and accept the complete ETX telescope, plus optional accessories. **#773**: for ETX-70AT; **#774**: for ETX-90AT; **#776**: for ETX-105AT; **#775**: for ETX-125AT.

Soft Carry Bags: Meade soft-padded carry bags are well-suited to travel with the ETX-90AT or the ETX-90 Spotting Scope. Each carry bag includes a shoulder strap and permits ready transport of the complete telescope, including accessories. **#765:** for ETX-90AT; **#766:** for ETX-90 Spotting Scope.

Power Adapters and Cords: In addition to their internal battery packs ETX-90AT, ETX-105AT, and ETX-125AT telescopes may be powered from 115v AC home electricity with the **#541 AC Adapter** *(not shown)*. The #541 plugs into any standard home outlet and includes a 25 ft. cord connecting to the telescope's control panel; input voltage to the telescope is 12v DC. Alternately, either telescope may be powered in the field from an automobile cigarette lighter plug by using the **#607 Power Cord** *(shown)***,** a 25 ft. cord which plugs into the telescope's control panel and supplies 12v DC directly from the car battery.